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Edition 1.1 2024-06
CONSOLIDATED VERSION

INTERNATIONAL STANDARD

colour inside

Specifications for particular types of winding wires –
Part 57: Polyamide-imide enamelled round copper wire, class 220

IEC 60317-57:2010-08+AMD1:2024-06 CSV(en)

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In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 60317-57 has been prepared by IEC technical committee 55: Winding wires.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This standard is to be read in conjunction with IEC 60317-0-1 ~~(2008)~~:2013 and its Amendment 1:2019.

The numbering of clauses in this standard is not continuous from Clauses 23 to 30 in order to reserve space for possible future wire requirements prior to those for wire packaging.

A list of all the parts in the IEC 60317 series, under the general title *Specifications for particular types of winding wires*, can be found on the IEC website.

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- revised.

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INTRODUCTION

This part of IEC 60317 is one of a series which deals with insulated wires used for windings in electrical equipment. The series has three groups describing

1) test methods (IEC 60851);
2) specifications for particular types of winding wire (IEC 60317);
3) packaging of winding wires (IEC 60264).

SPECIFICATIONS FOR PARTICULAR TYPES OF WINDING WIRES –

Part 57: Polyamide-imide enamelled round copper wire, class 220

1 Scope

This part of IEC 60317 specifies the requirements of an enamelled round copper winding wire of class 220 with a sole coating based on polyamide-imide resin, which may be modified providing it retains the chemical identity of the original resin and meets all specified wire requirements.

Class 220 is a thermal class that requires a minimum temperature index of 220 and a heat shock temperature of at least 240 ºC.

The temperature in degrees Celsius corresponding to the temperature index is not necessarily that at which it is recommended that the wire be operated and this will depend on many factors, including the type of equipment involved.

The range of nominal conductor diameters covered by this standard is as follows:

– Grade 1: 0,071 mm up to and including 1,600 mm;
– Grade 2: 0,071 mm up to and including 1,600 mm.

The nominal conductor diameters are specified in Clause 4 of IEC 60317-0-1.

2 Normative references

The following ~~referenced~~ documents are ~~indispensable for the application~~ referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60317-0-1[1]:~~2008~~2013, *Specifications for particular types of winding wires – Part 0-1: General requirements – Enamelled round copper wire*.
IEC 60317-0-1:2013/AMD1:2019

~~**3 Definitions, general notes on methods of test and appearance**~~

~~**3.1 Definitions and general notes on methods of test**~~

~~For definitions and general notes on methods of test, see Clause 3 of IEC 60317-0-1. In case of inconsistencies between IEC 60317-0-1 and this standard, IEC 60317-57 shall prevail.~~

~~**3.2 Appearance**~~

~~See Subclause 3.3 of IEC 60317-0-1.~~

[1] There exists a consolidated edition 4.1:2021 that includes IEC 60317-0-1:2013 and its Amendment 1:2019.

3 Terms, definitions, general notes and appearance

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60317-0-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.2 General notes

3.2.1 Methods of test

Subclause 3.2.1 of IEC 60317-0-1:2013 and IEC 60317-0-1:2013/AMD1:2019 applies.

In case of inconsistencies between IEC 60317-0-1 and this document, IEC 60317-57 shall prevail.

3.2.2 Winding wire

Subclause 3.2.2 of IEC 60317-0-1:2013 applies.

3.3 Appearance

Subclause 3.3 of IEC 60317-0-1:2013 applies.

4 Dimensions

See Clause 4 of IEC 60317-0-1.

5 Electrical resistance

~~See Clause 5 of IEC 60317-0-1.~~

Clause 5 of IEC 60317-0-1:2013 and IEC 60317-0-1:2013/AMD1:2019 applies.

6 Elongation

See Clause 6 of IEC 60317-0-1.

7 Springiness

See Clause 7 of IEC 60317-0-1.

8 Flexibility and adherence

See Clause 8 of IEC 60317-0-1, where the constant K used for the calculation of the number of revolutions for the peel test shall be 75 mm.

9 Heat shock

See Clause 9 of IEC 60317-0-1, where the minimum heat shock temperature shall be 240 ºC.

10 Cut-through

No failure shall occur within 2 min at 350 ºC.

11 Resistance to abrasion (nominal conductor diameters from 0,250 mm up to and including 1,600 mm)

The wire shall meet the requirements given in Table 1.

Table 1 – Resistance to abrasion

Nominal conductor diameter	Grade 1		Grade 2	
	Minimum average force to failure	Minimum force to failure of each measurement	Minimum average force to failure	Minimum force to failure of each measurement
mm	N	N	N	N
0,250	3,00	2,55	4,90	4,15
0,280	3,25	2,75	5,25	4,45
0,315	3,50	2,95	5,65	4,80
0,355	3,75	3,20	6,05	5,15
0,400	4,05	3,45	6,50	5,50
0,450	4,35	3,70	7,00	5,90
0,500	4,65	3,95	7,50	6,35
0,560	5,00	4,25	–	–
0,630	5,35	4,55	–	–
0,710	5,70	4,85	–	–
0,800	6,10	5,15	–	–
0,900	6,55	5,55	–	–
1,000	7,05	5,95	–	–
1,120	7,60	6,45	–	–
1,250	8,20	6,95	–	–
1,400	8,80	7,45	–	–
1,600	9,45	8,00	–	–
For intermediate nominal conductor diameters, the value of the next largest nominal conductor diameter shall be taken.				

12 Resistance to solvents

See Clause 12 of IEC 60317-0-1.

13 Breakdown voltage

See Clause 13 of IEC 60317-0-1, where the elevated temperature is 220°C.

14 Continuity of insulation

See Clause 14 of IEC 60317-0-1.

15 Temperature index

See Clause 15 of IEC 60317-0-1, where the minimum temperature index shall be 220.

16 Resistance to refrigerants

~~Test appropriate but no requirements specified.~~

Test inappropriate.

17 Solderability

Test inappropriate.

18 Heat bonding

Test inappropriate.

19 Dielectric dissipation factor

Test inappropriate.

20 Resistance to transformer oil

~~Test appropriate but no requirements specified.~~

Test inappropriate.

21 Loss of mass

Test inappropriate.

22 High temperature failure

Test appropriate but no requirements specified.

23 Pin hole test

Test requirements under consideration.

30 Packaging

See Clause 30 of IEC 60317-0-1.

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